

**WHAT IS CLAIMED IS:**

1. A wiring board comprising:  
an insulative base material;  
conductor patterns formed thereon; and  
magnetic thin films formed on said conductor pattern.
2. The wiring board according to claim 1, wherein said magnetic thin films are formed on said conductor patterns along outer surfaces of said conductor patterns.
3. The wiring board according to claim 1, wherein said magnetic thin films are formed with an insulation layer interposed therebetween, that covers entirety of surface of said wiring board on which said conductor patterns are formed.
4. The wiring board according to claim 2, wherein said base material is configured of a flexible material.
5. The wiring board according to claim 4, wherein said flexible material is a polyimide.
6. The wiring board according to claim 1, wherein said magnetic thin films are produced by at least one of sputtering and vapor deposition.
7. The wiring board according to claim 1, wherein thickness of said magnetic thin films is within range of 0.3  $\mu\text{m}$  to 20  $\mu\text{m}$ .
8. The wiring board according to claim 1, wherein said magnetic thin film is configured of a magnetic loss material having a composition represented by M-X-Y, where M is at least one of Fe, Co, and Ni, X is at least one element other than M or Y, and Y is at least one of F, N, and O,  
said magnetic loss material is a narrow-band magnetic loss material in which a maximum value  $\mu$ "max of loss factor  $\mu$ " that is imaginary component in complex permeability characteristic of said magnetic loss material exists within

a frequency range of 100 MHz to 10 GHz, and

a relative bandwidth bwr is not greater than 200% where the relative bandwidth bwr is obtained by extracting a frequency bandwidth between two frequencies at which the value of  $\mu''$  is 50% of the maximum  $\mu''_{max}$  and normalizing the frequency bandwidth at the center frequency thereof.

9. The wiring board according to claim 8, wherein X component of said magnetic loss material is at least one of C, B, Si, Al, Mg, Ti, Zn, Hf, Sr, Nb, Ta, and rare earth elements.

10. The wiring board according to claim 8, wherein, in said magnetic loss material, said M exists in a granular form dispersed in matrix of said X-Y compound.

11. The wiring board according to claim 8, wherein mean particle diameter of particles M having said granular form is within range of 1 nm to 40 nm.

12. The wiring board according to claim 8, wherein said magnetic loss material exhibits an anisotropic magnetic field  $H_k$  of 600 Oe ( $4.74 \times 10^4$  A/m) or less.

13. The wiring board according to claim 8, wherein said magnetic loss material is selected from  $Fe_\alpha-Al_\beta-O_\gamma$  and  $Fe_\alpha-Si_\beta-O_\gamma$ .

14. The wiring board according to claim 8, wherein size of saturation magnetization in said magnetic loss material is within a range of 80% to 60% of saturation magnetization of a metal magnetic body consisting solely of M component.

15. The wiring board according to claim 8, wherein said magnetic loss material exhibits a DC electrical resistivity that is within a range of 100  $\mu\Omega\cdot cm$  to 700  $\mu\Omega\cdot cm$ .

16. The wiring board according to claim 1, wherein said magnetic thin film is configured of a magnetic loss material having a composition represented

by M-X-Y, where M is at least one of Fe, Co, and Ni, X is at least one element other than M or Y, and Y is at least one of F, N, and O,

said magnetic loss material is a broad-band magnetic loss material in which maximum value  $\mu''_{\max}$  of loss factor  $\mu''$  that is imaginary component in complex permeability characteristic of said magnetic loss material exists within a frequency range of 100 MHz to 10 GHz, and

a relative bandwidth  $b_{\text{wr}}$  is not smaller than 150% where the relative bandwidth  $b_{\text{wr}}$  is obtained by extracting a frequency bandwidth between two frequencies at which the value of  $\mu''$  is 50% of the maximum  $\mu''_{\max}$  and normalizing the frequency bandwidth at the center frequency thereof.

17. The wiring board according to claim 16, wherein size of saturation magnetization of said magnetic loss material is within range of 60% to 35% of saturation magnetization of a metal magnetic body consisting solely of M component.

18. The wiring board according to claim 16, wherein said magnetic loss material exhibits a DC electrical resistivity having a value larger than 500  $\mu\Omega\cdot\text{cm}$ .

19. A wiring board comprising:  
a board of at least one layer comprising a conductor part; and  
magnetic thin films deployed at least on part of said board or said conductor part.

20. The wiring board according to claim 19, wherein said conductor part has a ground part that is either a ground surface or that comprises ground patterns deployed on one surface of said board, and entire surface of said ground part is covered with a magnetic thin film.

21. The wiring board according to claim 19, wherein said conductor part comprises at least one of ground patterns or conductor patterns deployed on one surface of said board, or comprises a ground surface deployed over

entirety of one surface of said board, and at least part of said conductor part is formed by an electrically conductive magnetic thin film.

22. The wiring board according to claim 19, wherein said conductor part comprises signal line conductor patterns.

23. The wiring board according to claim 22, wherein said magnetic thin film is formed on said signal line conductor patterns.

24. The wiring board according to claim 22, wherein said magnetic thin films are formed so as to be separated from signal line conductor patterns in portion where said signal line conductor patterns are not formed.

25. The wiring board according to claim 22, wherein said magnetic thin film is deployed with an insulation layer interposed therebetween so as to cover said conductor patterns.

26. The wiring board according to claim 22, wherein said magnetic thin film is fabricated by at least one method of sputtering and vapor deposition.

27. The wiring board according to claim 22, wherein said magnetic thin film has a thickness within a range of 0.3  $\mu\text{m}$  to 20  $\mu\text{m}$ .

28. The wiring board according to claim 22, wherein said wiring board is a multilayer printed wiring board comprising a structure of at least 3 layers.

29. The wiring board according to claim 22, wherein  
said magnetic thin film is configured of a magnetic loss material  
represented by M-X-Y, where M is at least one of Fe, Co, and Ni, Y is at least  
one of F, N, and O, and X is at least one element other than M or Y,

said magnetic loss material is a broad-band magnetic loss material in  
which maximum value  $\mu_{\max}$  "max of loss factor  $\mu$ " that is imaginary component in  
complex permeability of said magnetic loss material exists within a frequency  
range of 100 MHz to 10 GHz, and

a relative bandwidth bwr is not smaller than 150% where the relative  
bandwidth bwr is obtained by extracting a frequency bandwidth between two

frequencies at which the value of  $\mu''$  is 50% of the maximum  $\mu''_{\max}$  and normalizing the frequency bandwidth at the center frequency thereof.

30. The wiring board according to claim 29, wherein size of saturation magnetization in said magnetic loss material is within a range of 60% to 35% of saturation magnetization of a metal magnetic body consisting solely of M component.

31. The wiring board according to claim 19, wherein said magnetic loss material exhibits a DC electrical resistivity having a value larger than 500  $\mu\Omega\cdot\text{cm}$ .

32. The wiring board according to claim 22, wherein said magnetic thin film is configured of a magnetic loss material having a composition represented by M-X-Y, where M is at least one of Fe, Co, and Ni, Y is at least one of F, N, and O, and X is at least one element other than M or Y,

said magnetic loss material is a narrow-band magnetic loss material in which maximum value  $\mu''_{\max}$  of loss factor  $\mu''$  that is imaginary component in complex permeability of said magnetic loss material exists within a frequency range of 100 MHz to 10 GHz, and

a relative bandwidth bwr is not greater than 200% where the relative bandwidth bwr is obtained by extracting a frequency bandwidth between two frequencies at which the value of  $\mu''$  is 50% of the maximum  $\mu''_{\max}$  and normalizing the frequency bandwidth at the center frequency thereof.

33. The wiring board according to claim 32, wherein size of saturation magnetization in said magnetic loss material is within a range of 80% to 60% of saturation magnetization of a metal magnetic body consisting solely of M component.

34. The wiring board according to claim 32, wherein said magnetic loss material exhibits a DC electrical resistivity that is within a range of 100  $\mu\Omega\cdot\text{cm}$  to 700  $\mu\Omega\cdot\text{cm}$ .

35. The wiring board according to claim 32, wherein X component of said magnetic thin film is at least one of C, B, Si, Al, Mg, Ti, Zn, Hf, Sr, Nb, Ta, and rare earth elements.

36. The wiring board according to claim 32, wherein, in said magnetic loss material, said M exists in a granular form dispersed in matrix of said X-Y compound.

37. The wiring board according to claim 32, wherein mean particle diameter of particles M having said granular form is within range of 1 nm to 40 nm.

38. The wiring board according to claim 32, wherein said magnetic loss material exhibits an anisotropic magnetic field  $H_k$  of 600 Oe ( $5.34 \times 10^4$  A/m) or less.

39. The wiring board according to claim 32, wherein said magnetic loss material is selected from  $Fe_{\alpha}Al_{\beta}O_{\gamma}$  and  $Fe_{\alpha}Si_{\beta}O_{\gamma}$ .